CLAIMS

We claim:

1. An isolated recombinant polyepitope polypeptide comprising a plurality of amino acid segments from one or more HIV-1 proteins, wherein two adjacent amino acid segments are linked by a spacer peptide.

2. The isolated recombinant polypeptide of claim 1, wherein the spacer peptide links multiple groups of amino acid segments.

3. The isolated recombinant polypeptide of claims 1 or 2, further comprising a targeting signal, wherein the targeting signal targets the polypeptide to a lysosome or to a proteosome.

4. The isolated recombinant polypeptide of claim 3, wherein the targeting signal comprises a targeting-competent fragment of lysosomal integral membrane protein-II or ubiquitin.

5. The isolated recombinant polypeptide of claims 1 or 2, further comprising a plurality of amino acid segments from one or more HIV-1 coreceptors.

6. The isolated recombinant polypeptide of claim 5, wherein at least one coreceptor is CCR5.

7. The isolated recombinant polypeptide of claims 1 or 2, wherein at least one spacer peptide is the tri-amino acid lysine - alanine - alanine, or proline - glycine - proline.

8. The isolated recombinant polypeptide of claims 1 or 2, wherein the amino acid segments comprise human cytotoxic T-lymphocyte stimulatory epitopes, human T-helper cell stimulatory epitopes, human B-cell stimulatory epitopes, or combinations of two or more stimulatory epitopes thereof.

9. An isolated nucleic acid molecule encoding a polypeptide of any one of claims 1-8.

10. A vector comprising a nucleic acid molecule of claim 9.

11. A host cell transformed with a vector of claim 10.

12. A composition comprising at least one polypeptide of claim 1 or claim 2 or at least one nucleic acid molecule of claim 9.

13. The composition of claim 12, further comprising at least one component selected from the group consisting of pharmaceutically acceptable carriers, adjuvants, and combinations of two or more thereof.

14. A method of eliciting an immune response against an antigenic epitope in a subject, comprising introducing into the subject the composition of claim 12 or claim 13.

15. A method for inhibiting or treating HIV-1 in a subject, comprising administering to the subject the composition of claim 12 or claim 13.

16. A method for enhancing an immune response in a subject, comprising administering to the subject the composition of claim 12 or claim 13.

17. An isolated recombinant polyepitope polypeptide comprising an amino acid sequence selected from the group consisting of sequences recited in SEQ ID NOs: 2, 4, 5, 6, 8, 10, and combinations of two or more thereof.

18. An isolated nucleic acid molecule encoding a polypeptide of claim 17.

19. The isolated nucleic acid molecule of claim 18, wherein the nucleic acid molecule comprises a sequence selected from the group consisting of sequences recited in SEQ ID NOs: 1, 3, 7, and 9.

20. A vector comprising at least one nucleic acid molecule of claim 19.

21. A host cell transformed with a vector of claim 20.

22. A composition comprising at least one polypeptide of claim 17 or at least one nucleic acid molecule of claim 18 or claim 19.

23. The composition of claim 22, further comprising at least one component selected from the group consisting of pharmaceutically acceptable carriers, adjuvants, and combinations of two or more thereof.

24. A method of eliciting an immune response against an antigenic epitope in a subject, comprising introducing into the subject the composition of claim 22 or claim 23.

25. A method for inhibiting or treating HIV-1 in a subject, comprising administering to the subject the composition of claim 22 or claim 23.

26. A method for enhancing an immune response in a subject, comprising administering to the subject the composition of claim 22 or claim 23.